

- ☐ fossil energy
- ☒ environmental
- ☐ energy efficiency
- ☐ other

REMEDIATION OF CONTAMINATED MINE WATER

States Impacted:

Pennsylvania, West Virginia,
Kentucky, Ohio, Virginia,
Tennessee, Colorado,
California, Kentucky

Benefit Areas:

Environmental Quality
Improved

Participants:

Pennsylvania Department of
Environmental Protection,
U.S. Environmental Protection
Agency, Maryland Department
of the Environment, West
Virginia Department of
Environmental Protection

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Description

Recognizing that over 4,500 miles of streams and rivers in the United States have been adversely affected by acid mine drainage, FETC, in combination with other Federal agencies, affected States, industrial partners and various watershed coalitions, is developing, evaluating, and refining methods to improve the water quality. The most recent success of these methods is with passive treatment, utilizing inexpensive, low-maintenance processes, such as those that occur naturally in wetlands. Sizing and design guidelines have resulted in well over one thousand passive treatment systems being constructed at mine sites, worldwide. Properly designed, these systems discharge water conducive to normal stream use, leaving streams able to support vigorous populations of organisms and fish.

When passive treatment is not an option, new chemical treatments are being developed. FETC researchers have patented the In-Line System which uses conventional neutralization chemicals up to 30% more efficiently than normal water treatment technology, and is less expensive to install and operate. FETC has also pioneered a bacterial sulfate reduction technique for treating heavily contaminated metal mine drainage. Using this technique, metals, such as copper and zinc, can be economically recovered, while the volume of metal sludge requires disposal. Compared with conventional treatments which produce large volumes of mixed toxic wastes, this technique separates out the minimal toxic metals, primarily iron and manganese, from the sludge, so that they can be landfilled inexpensively.

Technologies that control acid generation at its source are also being developed. An example is the use of geophysical techniques to identify leaky zones in streambeds, and then to seal these fractures with grout. Successfully and inexpensively implemented to remediate streams in Maryland, stream water that was flowing into the mines and becoming contaminated and then flowing down-gradient to a tributary of the Potomac River, is now flowing above active longwall mines.

Goals

To address the national problem of mining-induced environmental problems through the use of passive and chemical treatment technologies.

Tangible Benefits

National: Various passive and chemical treatment technologies are now being used at sites across the country and around the world. The quality of entire watersheds have been improved. In part, affected State reclamation agencies, as well as the mining industry, now have the tools to remediate damaged waterways, while avoiding huge water treatment costs in the future.